

## TWO NEW SPECIES OF ACARINA FROM BAT GUANO FROM AUSTRALIAN CAVES

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### SUMMARY

In the present paper two new species of Acarina found associated with the guano of bat caves in the Eastern States of Australia and South Australia are described. The first, *Coproglyphus dewae* sp. nov. (fam. Tyroglyphidae, subfam. Carpglyphinae) is entirely of coprophilous habit in all stages. The other, *Neotrombidium gracilare* sp. nov. (fam. Leeenvenhoeekiidae) has only been found in the guano as adults, and is probably only coprophilous in that stage. The larvae when known may on analogy with the larval species *N. (Monunguis) streblidum* (Wharton), be found parasitic on Streblidae or other ectoparasites of bats.

The known species of *Neotrombidium*, whether known as adults or larvae, are discussed and their possible hosts considered.

Suborder SARCOPTIFORMES Reuter, 1909.

Family TYROGLYPHIDAE Donnadieu, 1868.

Subfamily CARPOGLYPHINAE Ouds., 1923.

Genus COPROGLYPHUS E. and F. Türk, 1956.

Türk, E. and F., 1956. Syst. u. Ökol der Tyroglyphiden Mitteleuropäischer Acarina, Bd. 1, Teil I, pp. 44, 45 and 181.

Type *C. stammeri* E. and F. Türk.

This genus, placed by E. and F. Türk in the subfamily Carpglyphinae, was erected for a new species found in bat guano from Erlangen in Germany.

Whereas Vitzthum, 1941, lists only the genera *Carpoglyphus* Robin, 1869, and *Ferminia* Oudemans, 1928, in the subfamily and Zachvatkin, 1941, includes *Hyadesia* Megn., 1889, and *Hericia* Can., 1888, along with *Carpoglyphus*, the Türks include *Hericia*, *Gohieria* Ouds., 1938, besides the type genus and their new genus *Coproglyphus*. Of the genera mentioned *Hyadesia* is now included in a separate subfamily, the Hyadesinae, while *Gohieria* Ouds., 1938, is a synonym of *Ferminia*<sup>1</sup> Ouds., 1928.

The four genera are keyed as follows (after E. and F. Türk):

1. Propodosoma in all stages with lens-like organs.

*Carpoglyphus* Robin 1869

No such organs present

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\* South Australian Museum.

<sup>1</sup> The genus *Ferminia* was erected by A. C. Oudemans, 1928 (8), for *Glyciphagus fuscus* Ouds., 1902. In 1939 (9) he re-named the genus *Gohieria* citing *Ferminia* as being used earlier by Barbour, 1926, for a honey-eater (Proc. New England Zool. Club, 9, p. 74) on information received from Dr. W. Meise of Dresden. Actually, according to Neave's Nomen. Zoologicus, 5, 1950, the name used by Barbour was *Ferminaria* not *Ferminia*, hence the latter and not *Gohieria* is the valid generic name for *Glyciphagus fuscus* Ouds., 1902.

2. Dorsal setae simple ..... 3  
 Dorsal setae more or less clavate or spathulate and ciliate.  
*Coproglyphus* E. and F. Türk 1956
3. Legs with strong spines. In tree sap .... *Hercia* Canest 1888  
 Legs with simple or feathered setae .... *Ferminia* Ouds. 1928

The genus *Coproglyphus* is defined by the Türks as follows; "Epimera I in both sexes joined. In the male epimera III joined with epimera IV. All other epimera free ending. Female genital orifice between coxae II and III; in male, genital orifice between coxae III and IV.

Type *Coproglyphus stammeri* n. sp."

***Coproglyphus dewae* sp. nov.**

Fig. 1 A-H.

**Description.**—*Holotype female* (Fig. 1 A-D): Shape broadly oval but squarish posteriorly. Dirty white in colour. Surface of dorsum strongly wrinkled with irregular lines. Length of idiosoma 322,<sup>2</sup> width 226. Legs I (excluding coxae) 182 long, II 187, III 211, IV 240.

**Dorsum.**—(Fig. 1A): With a lightly defined propodosomal shield, suture between propodosoma and hysterosoma ill-defined, pseudostigmatic organs on margins of propodosoma lateral of the shield well sclerotised and with a curved tapering and ciliated pseudostigmal seta posteriorly to 15 long, at the anterior end of the pseudostigmal organ with a minute seta (? Grandjean's organ). With 14 pairs of dorsal setae of varying lengths as follows: vertical internal (vi) 55, vertical exterior (ve) 41, inner propodosomal (ip) 58, outer propodosomal (ep) 58, first dorsal (d1) 44, second dorsal (d2) 17, third dorsal (d3) 15, fourth dorsal (d4) 15, inner humeral (hi) 58, outer humeral (he) 64, first lateral (l1) 29, second lateral (l2) 15, third lateral (l3) 15, posterior (p) 17, all these setae are blunt, ciliated and rod-like and tend to show a longitudinal splitting in the longer ones (Fig. 1C).

**Venter.**—(Fig. 1B): Epimera I united medially to form a short sternum touching the genitalia anteriorly, epimera III and IV joined. Coxae I, III and IV with a single simple seta, that on IV about three times as long as those on I and III. Genital orifice between coxae II and III, with a distinctly sclerotised boomerang-shaped plate anteriorly, with two pairs of short setae and the usual two pairs of small discs or suckers, length of orifice 90. Anal orifice 73 long, reaching tip of opisthosoma, with four pairs of short paranal setae. Midway between genital and anal orifices with one pair of short setae and posteriorly on each side of the anus a long simple seta (pa) to 260 in length. Posteriorly a short bursa copulatrix. The legs are fairly stout and subequal in length, tarsi all with a single claw on a long caruncle and reaching past the pulvilli; there appears to be no solenidia on tarsi I and II, but the tibiae of these legs carry a long recurved subapical seta.

**Allotype Male.**—(Fig. E-H): General facies as in female. Length of idiosoma 264, width 163. Legs I 152 long, II 154, III 172, IV 182.

**Dorsum.**—As in female but setae relatively shorter, vi 32, ve 26, ip 26, ep 26, d1 17, d2 6, d3 6, d4 9, hi 29, he 35, l1 15, l2 9, l3 9, p 9 and pa 131.

**Venter.**—(Fig. 1E): With the epimera as in the female. Genital orifice between coxae III and IV, with one pair of setae and the anterior sclerotised

<sup>2</sup> All measurements in micra ( $\mu$ ).

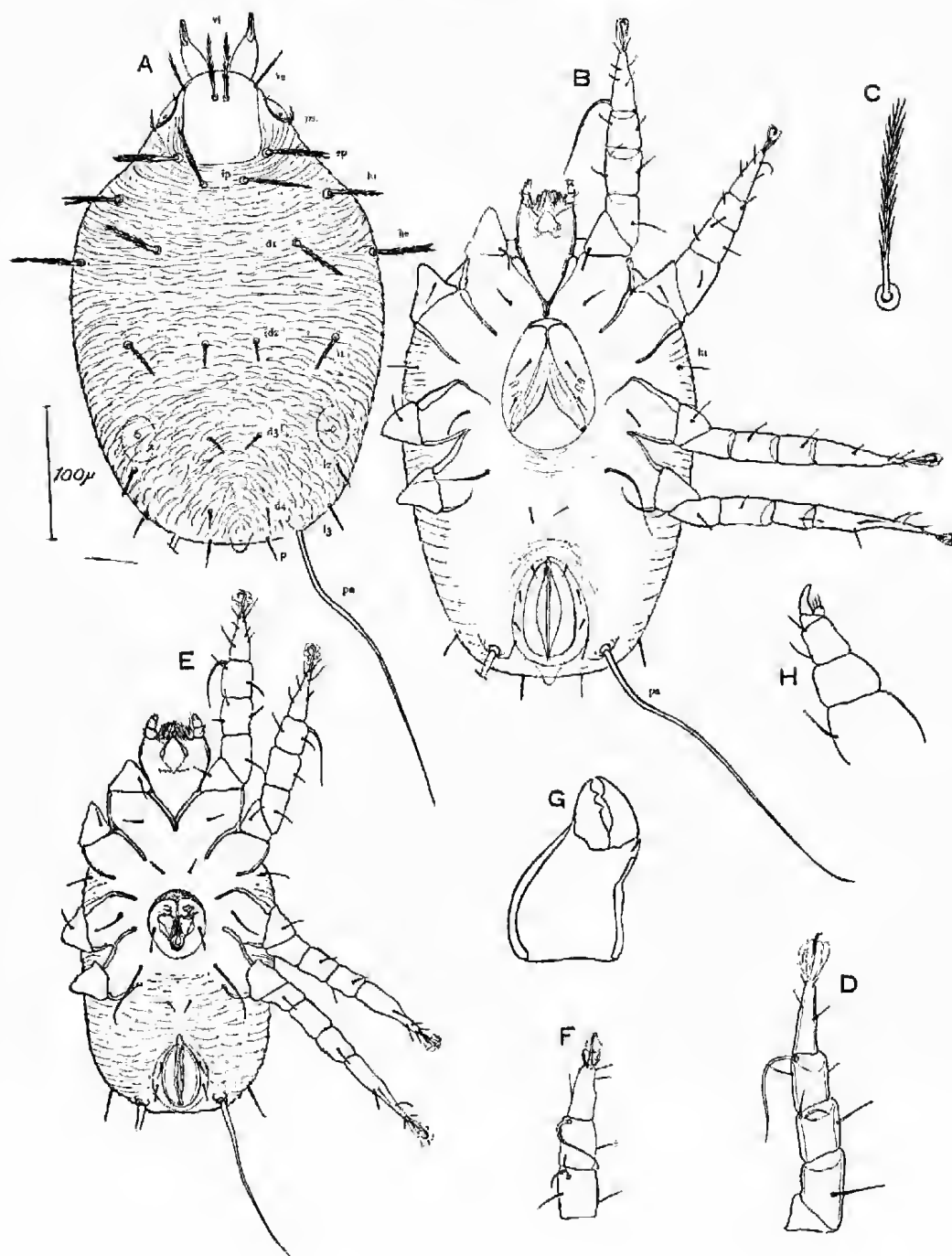


Fig. 1. *Coproglyphus dewae* sp. nov. A, dorsal view of female; B, ventral view of female; C, dorsal setae; D, leg I of female; E, ventral view of male; F, genu, tibia and tarsus of leg IV of male; G, mandible; H, palp.

boomerang-shaped plate as in the female. Coxal setae as in the female. There are only two pairs of anal setae, and a single pair of short setae between genital and anal orifices.

*Locality and Habitat.*—Numerous specimens from bat guano from Fig Tree Cave, Wombeyan, New South Wales, 21st Aug., 1960, collected by Miss Barbara Dcw, to whom the species is dedicated. Also from Railway Tunnel, North Sydney, N.S.W. (coll. B.D. 12/8/60), Basin Cave, Wombeyan, N.S.W., 21/8/60 (B.D.), and from Naracoorte, South Australia, Oct., 1961 (P. Aitken).

*Location of Types.*—In the South Australian Museum.

*Comparison with the Genotype.*—This new species has the same habitat as the genotype *Coproglyphus stammeri* E. and F. Türk. It differs in that the Türks' figures show the dorsal setae of *stammeri* to be of almost uniform length and slightly more clavate, whereas in *dewae* there are marked differences in the setae lengths, those of the d series except d1 being very much shorter. In *stammeri* the pseudostigmal setae are described as simple and not ciliated.

#### Suborder TROMBIDIFORMES Reuter 1909.

#### Family LEEUWENHOEKIIDAE Womersley 1948.

Leonardi, G., 1902. *Acarí sudamericañi*—Zool. Anz., 25, p. 18.

Type *Trombidium furcigerum* Leon., loc. cit., 17.

#### *Neotrombidium gracilare* sp. nov.

Fig. 2 A-N.

*Description.*—An elongate oval species with the hysterosoma narrower than the propodosoma and with a slight constriction between (Fig. 2A). Dorsum thickly furnished with trident-like setae (Fig. 2C, D) the tines of which are barbed and the middle tine the longest, all tines of equal thickness and apically pointed. Crista on an indistinct shield (Fig. 2B) with a transversely oval posterior sensillary area carrying long, fine, distally shortly barbed or ciliated setae; anteriorly the crista ends in a narrow elongated nasus with two simple but barbed setae (homologous with the anterior median scutal setae of larval Leewenhoekiidae). Eyes two on each side, sessile on ocular shields, in front of the middle of the crista, posterior eyes the smaller. Mandibles (Fig. 2E) very long and narrow, fixed digit slender, and non-serrated. Palpi with single claw on tibia, and a tibial comb of about 10-12 strong simple curved spine-like setae, on the inner face with a single spine-like seta scarcely stronger than the comb setae; tarsi slightly over-reaching tip of tibial claw. Legs long and slender, not exceeding body length, furnished with simple barbed setae, tarsi 1 4 to 5 times as long as high, with small paired claws; claws of other legs somewhat larger, coxae in two groups widely separate and with tapering barbed setae (Fig. 2I and J), coxae of leg I with the outer anterior angle produced and cone-like (Fig. 2I). Genitalia with two pairs of elongate oval discs (Fig. 2K).

*Holotype Female.*—Length of idiosoma (mounted) 1580, width across propodosoma 720. Crista 245 long, sensillae 86, sensillary area 29 long by 48 wide, anterior setae 70. Mandibles 246 long. Palpal claw 35. Dorsal setae anteriorly 43, posteriorly 52 long; ventral setae 30 long. Genital opening 192 long. Anal opening 82 long. Legs I 979 long, II 706, III 787, IV 1018; tarsus I 254 long by 72 high.

*Allotype Male.*—Length of idiosoma 1162, width across propodosoma 504. Legs I 926 long, II 821, III 917, IV 1200; tarsus I 312 long by 62 high.

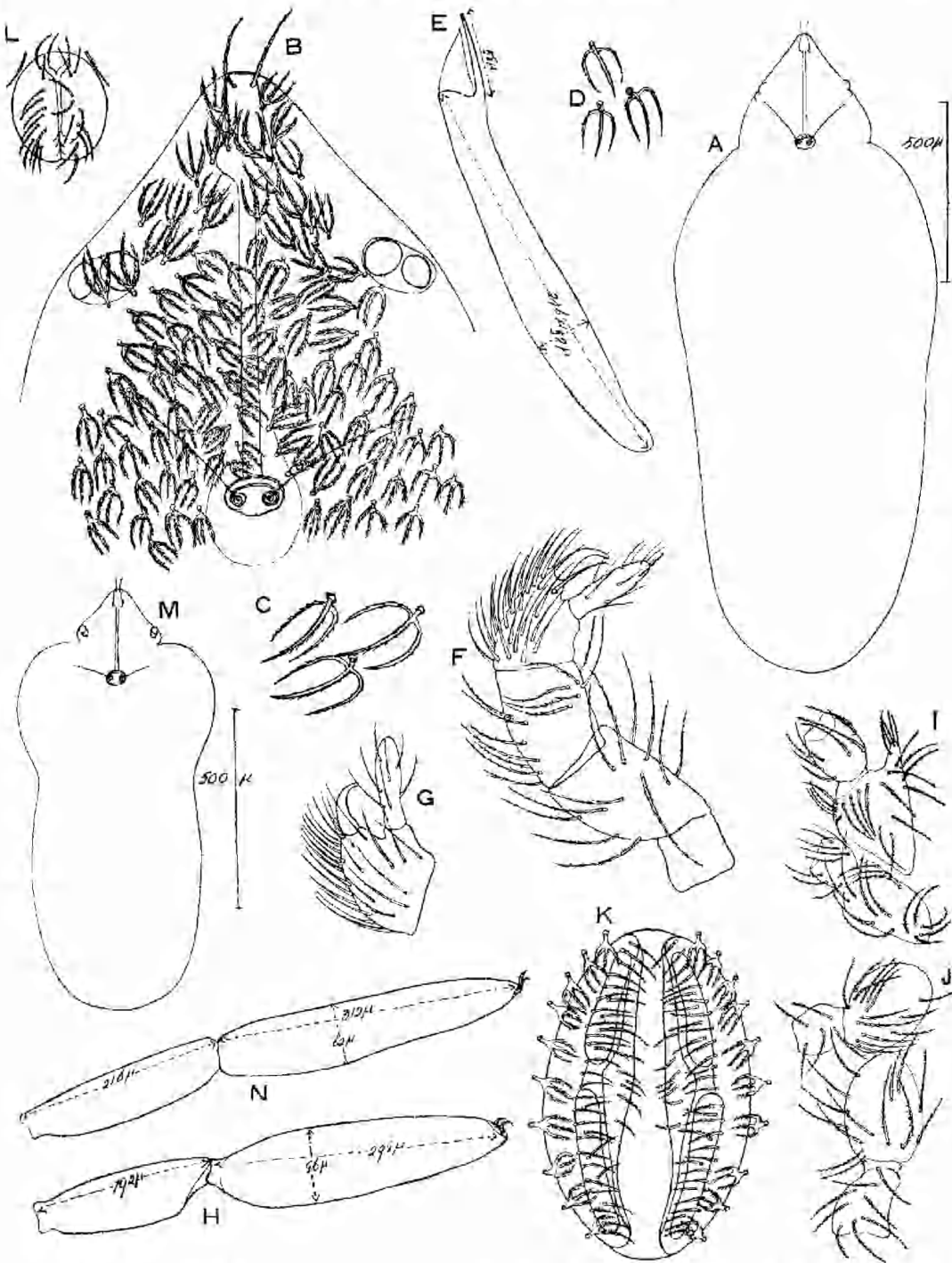


Fig. 2. *Neotrombidium gracilare* sp. nov. A-L female: A, body outline; B, anterior of propodosoma showing crista and eyes; C, medial dorsal setae; D, ventral setae; E, mandible; F, palp from inside; G, palpal tibia and tarsus from outside; H, tibia and tarsus of leg I (holotype); I, coxae I and II; J, coxae III and IV; K, genital orifice; L, anal orifice; M-N, male: M, outline of body; N, tibia and tarsus of leg I of allotype.

*Other Specimens.*—Six other females showed some variation in size, being generally rather larger than the type. The length of the legs and proportions of the front tarsi were also variable, as follows: Legs I 987-1181 (mean 1092), II 598-797 (742), III 720-893 (828), IV 979-1152 (1074); ratio tarsal length to height 3.5-4.4 (4.1). The larva is unknown.

*Locality and Habitat.*—The holotype female from bat guano from Fig Tree Cave, Wombeyan, New South Wales, Aug. 21st, 1961 (coll. Miss B. Dew). A smaller specimen, probably a nymph, from similar habitat from Murder Cave, Cliefden, N.S.W., Apr. 2nd, 1960 (B.D.). A further eight specimens, of which one was a male (the allotype), have been received from bat guano from Punch-bowl Cave, N.S.W., collected by Messrs. D. Purchase and F. Slaker, June 7th, 1958.

*Location of Types.*—South Australian Museum.

#### *Remarks on the Genus Neotrombidium*

Southcott in his review of the genus (11) lists five species known from the adult, viz. *N. furcigerum* Leon. 1902, from Argentina, *N. opthalmicum* (Berl. 1888) from Paraguay, *N. barringtonense* Hirst 1928, from Australia, *N. tricuspidum* Borland 1956, from North Carolina, and *N. neptunium* Southcott 1961, from Queensland. Of these, only two, *barringtonense* and *tricuspidum*, are included in a list of five species known from the larvae. The other larval species are *N. streblidum* (Wharton, 1938) (= *Monunguis* Wharton, 1938) from Mexico, a new species undescribed recorded by Borland, 1956, from N. America, and *N. tenuipes* Womersley (= *Cockingsia* Womersley, 1954) from Malaya. Since Southcott's paper two other adult species have been described by André (1) from Angola, viz. *N. elongatum* and *N. armatum*. Thus with the new species *N. gracilare* described herein eight species of adults are now known and these can be keyed as follows:

#### Key to the known adult species of *Neotrombidium* Leon.

1. Median tine of dorsal setae more or less clavate 2  
     Median tine of dorsal setae pointed like the lateral tines 4
2. Median tine of dorsal setae 2 to 3 times as long as the laterals and with scale-like surface. Tarsi I ca. 3 times as long as high, 105 $\mu$  by 55 $\mu$ . Dorsal setae to 25 $\mu$  long (median tine) N. elongatum André, 1957 (Angola)  
     Median tine of dorsal setae only slightly longer than the laterals and with denticulate surface 3
3. Tarsi I 3 times as long as high, 210 $\mu$  by 70 $\mu$ . Dorsal setae to 35 $\mu$  long. Palpal tibia with comb of four strong curved spines N. armatum André, 1957. (Angola)  
     Tarsi I twice as long as high. Dorsal setae to 50 $\mu$  long. Palpal tibia with comb of four strong curved spines. Tarsi I slightly more than twice as long as high, 200 $\mu$  by 90 $\mu$ . N. neptunium n. nov. Southcott, 1961. (= tridentifer Southcott, 1957, non Ewing, 1909.) (Queensland, Australia.)
4. Tines of dorsal setae not serrate, setae to 15 $\mu$  long. Tarsi I 150 $\mu$  long by 70 $\mu$  high N. opthalmicum (Berl., 1888). (Paraguay)  
     Tines of dorsal setae serrated 5

5. Dorsal setae to  $70\mu$  long, median tine not much longer than laterals. Tarsi I ca. 3 times as long as high,  $200\mu$  by  $70\mu$ . *N. furcigerum* Leon., 1901.  
Genotype (Argentina).

Dorsal setae much shorter

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6. Coxae I with a pronounced extension of the outer anterior angle. Dorsal setae to  $43\mu$  long. Tarsi I ca. 4 times as long as high,  $240\mu$ - $318\mu$  (mean  $279\mu$ ) by  $57\mu$ - $82\mu$  ( $68\pm 4\mu$ ). Palpal tibia without accessory claw, with comb of 10-12 strong simple curved spines *N. gracilare* sp. nov.  
(New South Wales and South Australia in bat guano.)

Coxae I normal

7

7. Dorsal setae to  $35\mu$  long. Tarsi I three times as long as high  $216\mu$  by  $72\mu$ . Palpal tibia with 3 comb spines near base of claw.

*N. barringtonense* Hirst, 1928.  
(Queensland, Australia.)

Dorsal setae shorter, to  $26\mu$ . Tarsi I about twice as long as high,  $170\mu$  by  $83\mu$ . Palpal tibia with only one strong accessory spine near base.

*N. tricuspidum* Borland, 1956.  
(North America)

The biotope for most of these adult species is under loose bark or in leaf debris, except for *gracilare* which was found in bat guano in caves in Eastern Australia, inhabited by the common bat, *Miniopterus schreibersii blepotis* Temminck. No reference to the habitat of the two South American species, *N. furcigerum* and *N. ophthalmicum*, are given; but these also may possibly be from under bark.

The hosts of the known larval species with the exception of *N. streblidum* (Wharton) which is parasitic on Streblid flies, and *N. barringtonense* Hirst, still unknown, are timber infesting beetles of the families Cerambycidae and Cleridae. The following table summarises knowledge of the habitat of all eight species.

TABLE I.

Species	Adult	Larva	Adult biotope	Host of larva.
<i>furcigerum</i>	+	—	?	?
<i>ophthalmicum</i>	+	—	?	?
<i>barringtonense</i>	+	+	under bark	?
<i>tenaxipes</i>	—	+	—	Coleoptera, Cerambycidae.
<i>tricuspidum</i>	+	+	under bark	Coleoptera, Cerambycidae.
<i>neptunium</i>	+	—	under bark, & leaf litter.	?
sp. undescribed	—	+	—	Coleoptera, Cleridae.
<i>elongatum</i>	+	—	under bark	?
<i>armatum</i>	+	—	in leaf debris	?
<i>streblidum</i>	—	+	—	Diptera, Streblidae.
<i>gracilare</i>	+	—	in bat guano	?

In 1954, Southcott (10) suggested the synonymy of the genus *Monunguis* Wharton, erected for a species *streblida* Wharton found parasitic on bat flies, *Pterellipsia araneae* Coq. and *Trichobius dugesi* Townsend (Diptera, Streblidae) from a cave at Yucatan, Mexico, with *Neotrombidium*. Borland, 1956 (4), was somewhat doubtful of this synonymy but upon examination of a cotype

expressed the opinion "that while recognition of the synonymy may be expedient at the present time, as more data became available the two genera may be validly separated". From a close study of Wharton's figures and descriptions there are a number of features which might separate it from *Neotrombidium* but regretfully Borland did not refigure or redescribe the species. Until such times as this can be done, there is some doubt as to the synonymy.

*Cockingsia* Womersley, 1954, for *tenuipes* Womersley from Malaya was also synonymised in 1957 (11) by Southcott and this is certainly valid and the adult when known will undoubtedly be a typical *Neotrombidium*.

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